particular module 15 under test and so that the processed signal may be routed back to the test equipment 25 for evaluation.

Another alternative is to apply a more than one test signal to the modules 15. For example, an active test signal may be combined with a noise signal in order to test the noise tolerance of module 15. Furthermore, different type of active test signals may be sent simultaneously or in succession to the modules 15 under test in order to perform a variety of tests.

Fig. 6e illustrates an implementation for stress testing the modules 15 by adding noise to the test signal and/or degrading the test signal strength. In general, VOAs (variable optical attenuators) 80, 86 and an optical noise source 25 may be utilized to degrade the test signal strength and add an adjustable amount of noise to the test signal. More specifically, an optical noise source 25 may inject noise into the optical test signal via coupler 82.

The strength of this injected noise may be adjusted by the VOA 80. The OSA 83 may be used to measure amount of noise (e.g. measure the optical signal-to-noise ratio (OSNR)) and send such measurements to the AMS controller 100. The AMS controller 100 may then use measurements to control the OSNR by adjusting the VOA 80. As an alternative, the OSNR may also be adjusted by using a VOA in the test signal path and adjusting the test signal strength relative to the noise signal strength.

The strength of the combined noise and test signal may also be adjusted with VOA 86 under the control of AMS controller 100. In other words, the total signal strength of test signal plus noise may be degraded to place additional stress on the module 15 under test. For example, the module 15 may be a receiver and it is often quite useful to see how tolerant

the receiver is to a weak signal or a weak and noisy signal. The AMS controller 100 can place such stress on the receiver by adjusting the VOAs 80, 86.

Moreover, the noise measurements may also be stored in database 40 and used, for example, to calculate a pass/fail value for the module under test 15.

The optical noise source 25 may be constructed in various ways. A preferred construction is an ASE (amplified spontaneous emission) source. If the module 15 under test is a DWDM module the spectrum of the ASE should be flat so that a more-predictable amount of noise may be added to each channel of the DWDM signal.

The idea of noise loading in which noise is added to the test signal (e.g. such as with the configuration of Fig. 6e) is particularly useful when testing modules 15 having error correcting functionality. A prime example of such error correction functionality that is widely used in the optical communications field is FEC (forward error correction) in which error correcting codes are incorporated into the signal and then used to correct errors that may be detected at the receiver. Such FEC circuits are quite capable of eliminating most communications errors.

Indeed, FEC circuits are almost too successful when it comes time to test a module incorporating FEC. The FEC will mask errors during the testing process such that the true performance of an FEC module will not be known. By noise loading the FEC modules, however, one can gauge the performance thereof more accurately and consistently. In other words, the FEC algorithm may correct for defects in other portions of the module 15 under test such that the performance under degraded signal conditions is unsatisfactory; this can be seen by providing a degraded, or noise loaded, signal during test. Also, the FEC circuitry (e.g. an ASIC is typically used) may also have defects, and these are more easily seen with a

signal requiring extensive error correction. The coupling of this noise loaded condition with temperature cycling enables parallel testing of the FEC capability and other module defects, such as component infant mortalities and solder defects.

The switches (e.g. 235, 245) and splitters (e.g. 210) used by the invention are commercially available and conventional elements and will, therefore, not be discussed further herein.

The AMS controller 100 may be implemented in a variety of ways including a personal computer (PC) loaded with software to be more fully described below, an ASIC (application specific integrated circuit), firmware, etc. It is generally preferred to use a PC for AMS controller 100 because of the low cost, wide-availability, and easy programmability of PCs. It is also preferred to use one PC and associated display terminal per virtual oven 10. In this way, there can be provided one GUI 160 per virtual oven 10 that enables rapid understanding and control of each virtual oven 10.

Likewise, the database 40 may be implemented with a variety of devices such as a conventional database program specially configured to store and organize the data generated by the invention. The memory device storing the database 40 may be local to the AMS controller 100, but it is preferred to utilize a networked arrangement such as that shown in Fig. 4 which permits the database 40 to be accessed by any of the individual AMS controllers 100 associated with each of the virtual ovens 10.

Fig. 7 illustrates an alternative web-based architecture according to the invention. The WWW (World-Wide-Web) 700 is utilized as a medium to interconnect the components of the invention in a manner similar to that shown in Fig. 4.